# The Role of Multi-INT in Navy UAV Programs

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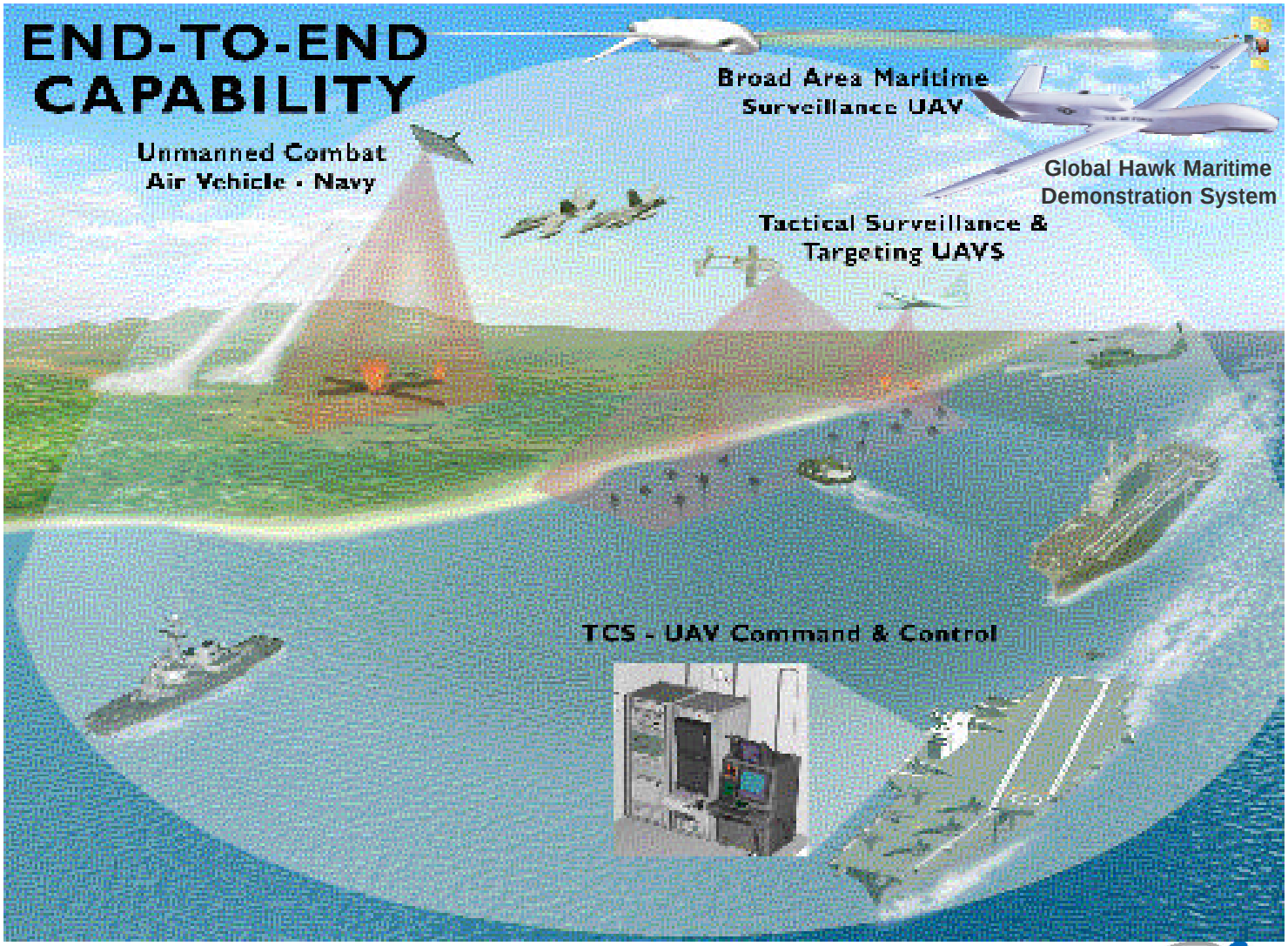
# Agenda

- Overview
- Naval UAV CONOPs / Roadmap
- Tactical Control System
- High Altitude Persistent ISR
- Multi-Platform / Multi-Sensor Integration
- Tactical Update
  - Firescout
  - Pioneer Improvement Program
- Questions?

# Naval UAV Roadmap

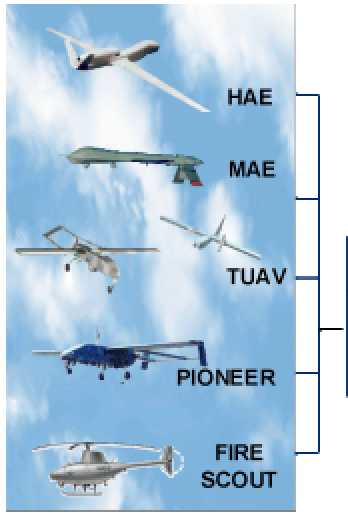
- Long-Dwell Standoff ISR UAV
  - Global Hawk Maritime Demonstration System for experimentation, CONOPS
  - BAMS UAV – Formal Acquisition Program
- Penetrating Surveillance/SEAD/Strike UAV
  - UCAV-N S&T Demo
  - Penetrating Surveillance initial focus with multi-mission capability
- Tactical Surveillance and Targeting UAV
  - Fund Pioneer OMN to support USMC requirements
  - Complete Firescout E&MD to enable naval UAV CONOPS, TTPs, Training, and to support development of TCS, TCDL and Advanced Laser Designator
  - Develop requirements across surface, submarine, and Marine Corps resource sponsors
- Infrastructure
  - Tactical Control System
  - Communications / Bandwidth

# Navy UAV
# Concept of Operations



# Tactical Control System (TCS)

# Tactical Control System (TCS) Vision

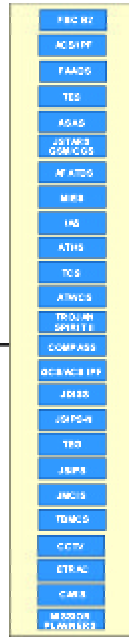



UAV GCS

**TCS ELEMENT**

MULTIPLE TYPE UAV & PAYLOAD CONTROL

C4I INTERFACES FOR IMAGERY & DATA



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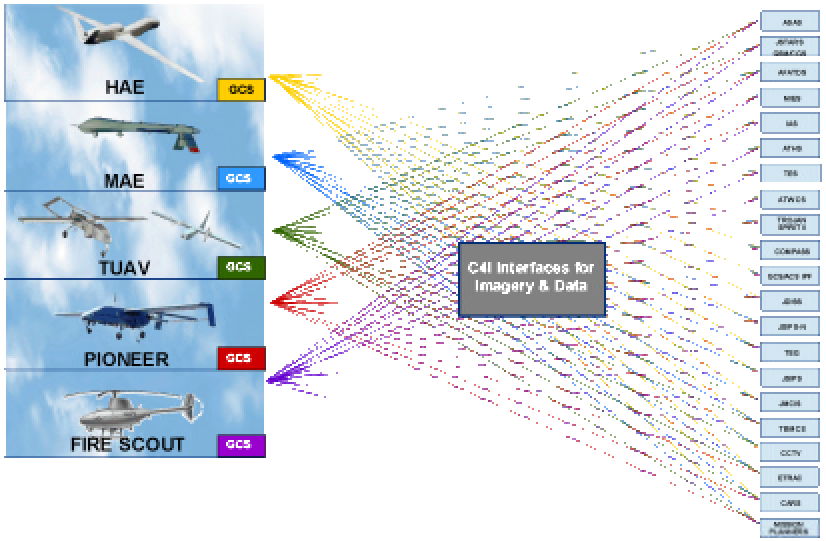


**TO THIS PARADIGM...**

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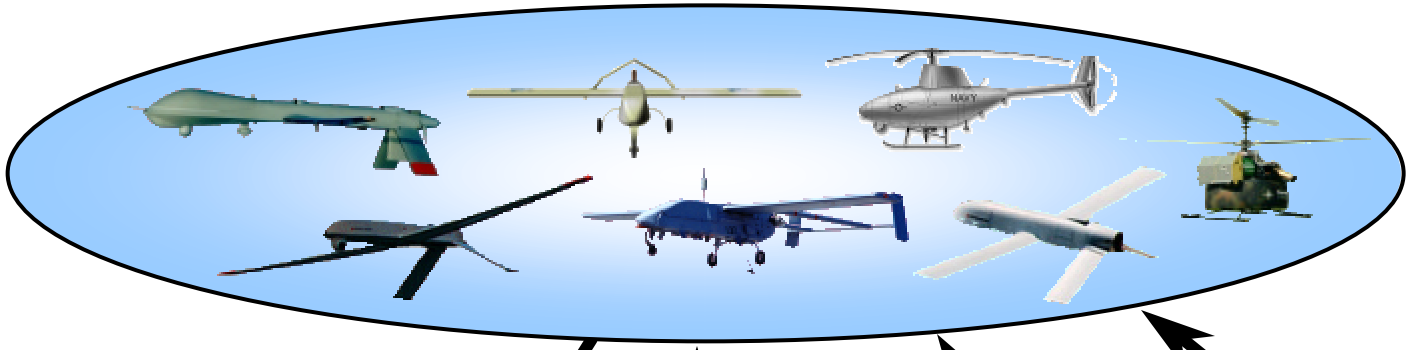
# TCS ORD Defined Levels Of UAV Command and Control



**LEVEL I**
- Secondary Product

**LEVEL II**
- Direct Data Receipt

**LEVEL III**
- Payload Control
- Direct Data Receipt

**LEVEL IV**
- Flight Control
- Payload Control
- Direct Data Receipt

**LEVEL V**
- Launch & Recovery
- Flight Control
- Payload Control
- Direct Data Receipt

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# High Altitude
# Persistent ISR Programs

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# High Altitude Persistent ISR Programs

## TWO PHASED APPROACH

- **Global Hawk Maritime Demonstration System (GHMD)**
  - Leverage USAF contracts to expeditiously procure a robust UAV system
  - Enduring unmanned test bed
    - » Support Development of Naval Doctrine, CONOPS and TTP development
    - » Experiment with alternate sensors: ATR, Comm Relay, SIGINT, Hyper-Spectral, etc…
    - » Study the integration of TCS into Tactical Support Center (TSC) and CVs/Big Decks

- **Broad Area Maritime Surveillance UAV (BAMS)**
  - Traditional requirements-based acquisition program
  - Develop maritime capable UAV systems for operational deployment (projected IOC FY 08).
  - AoA, ORD, C4ISP…. Will drive ultimate system configuration
  - Compliment to other Naval Aviation platforms and mission areas (e.g. MMA)

**Focus For Today's Brief :**
**Global Hawk Maritime Demonstration System**

# Global Hawk
# Maritime Demonstration System

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# Global Hawk Maritime Demonstration System

- Persistent maritime/land ISR capability
- CONPS & TTP Development
- Direct sensor data to CVN through CDL
- Battlegroup Support CONOPS
  - **Maritime/Littoral Battlespace Management**
  - **Strike support:  Precise target geo-location, BHA/BDA**
  - **CVBG/ARG tailored Signals Intelligence (SIGINT**
- Enduring Testbed – Modular Open System Payloads

**Inverse / Synthetic Aperture Radar**

**Ground / Maritime / Air Mobile Target Indicator**

**Electro-Optical / IR Wide Area Search**

**SIGINT**

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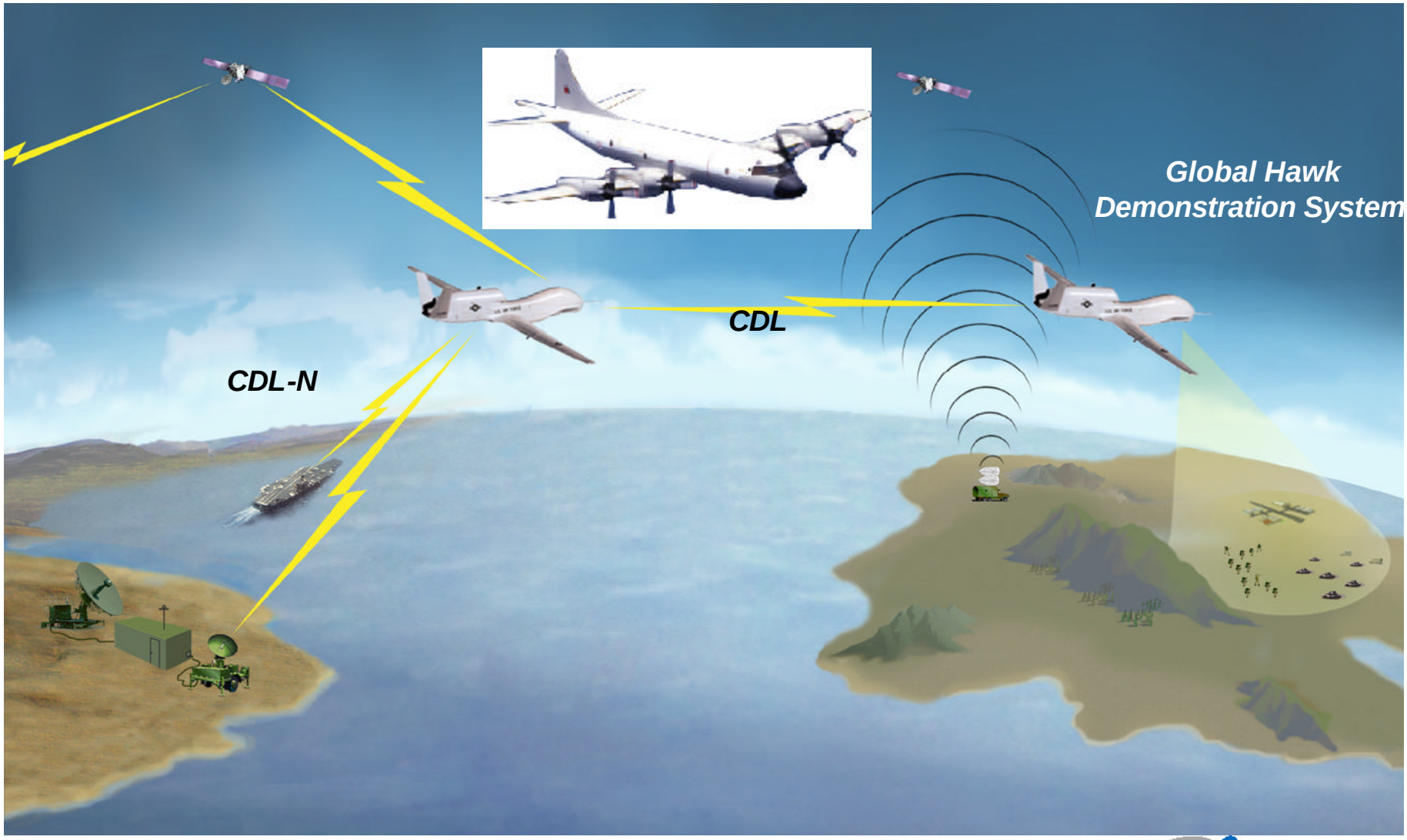
# Multi-INT Overview

- Multi-INT: Capability to have multiple sensors cover the same target or area, then correlate and fuse that information.
- Single Platform
  - Integration of sensors on a single platform
  - Not just co-resident sensors, but sensors that work together
- Multi-platform
  - Real time network and control connectivity
- Complementary sensor capabilities
- Requires data correlation and fusion
- Network Connectivity and flexible network design
- Coordination between dispersed sensor operators and analysts

Global Hawk Maritime Demonstration System is Test Bed to Validate These Concepts In Maritime Environment

# Global Hawk Maritime Demonstration System
# Concept Of Operations

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# Maritime Surveillance Technical Challenges

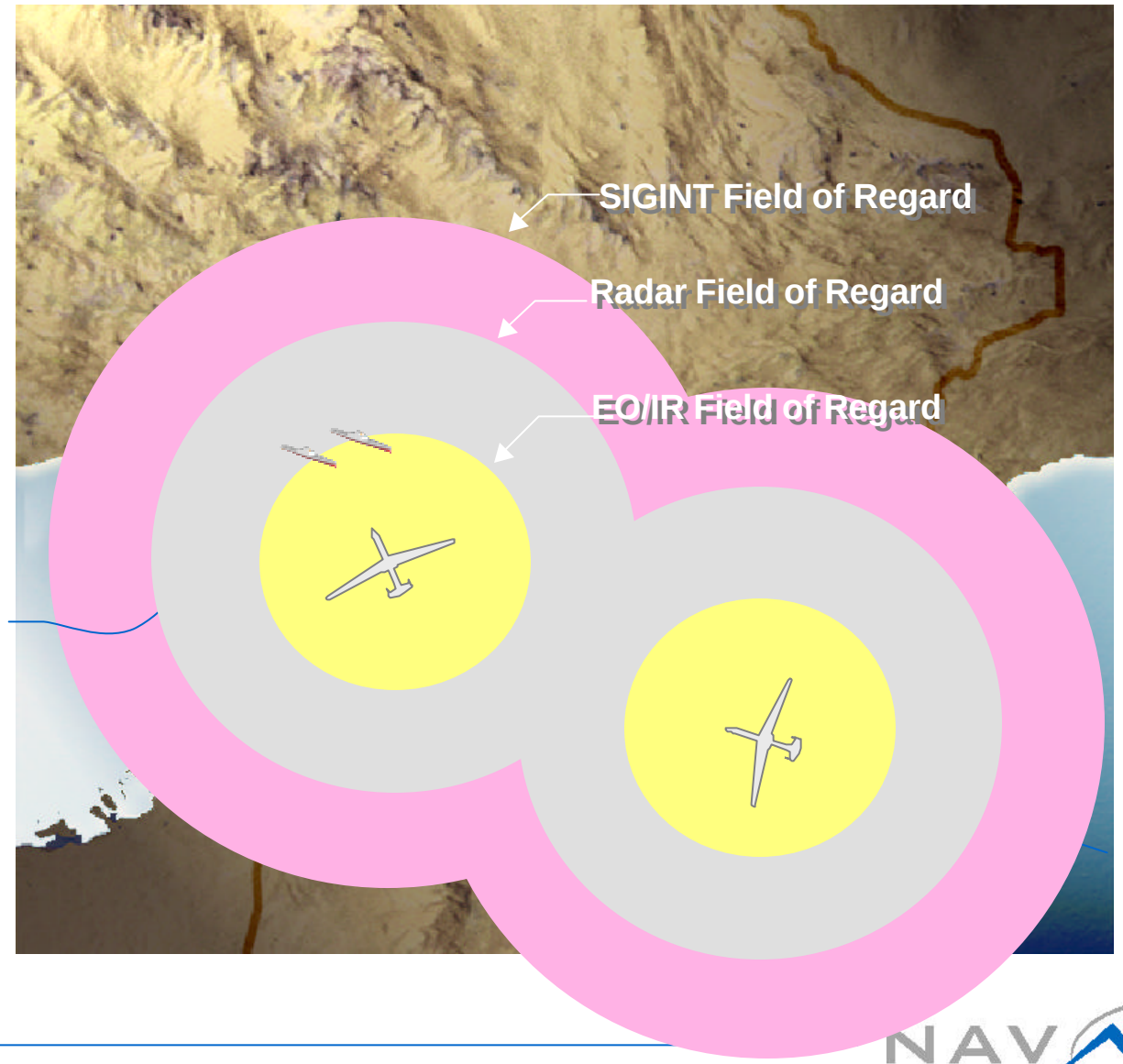
- Large Maritime Search Areas
- Mission Diversity
- Communications Bandwidth
- Manpower

**Open Systems, Modular Payloads, Interoperability and Sensor Data Integration Are Key To Address Maritime Surveillance Technical Challenges**

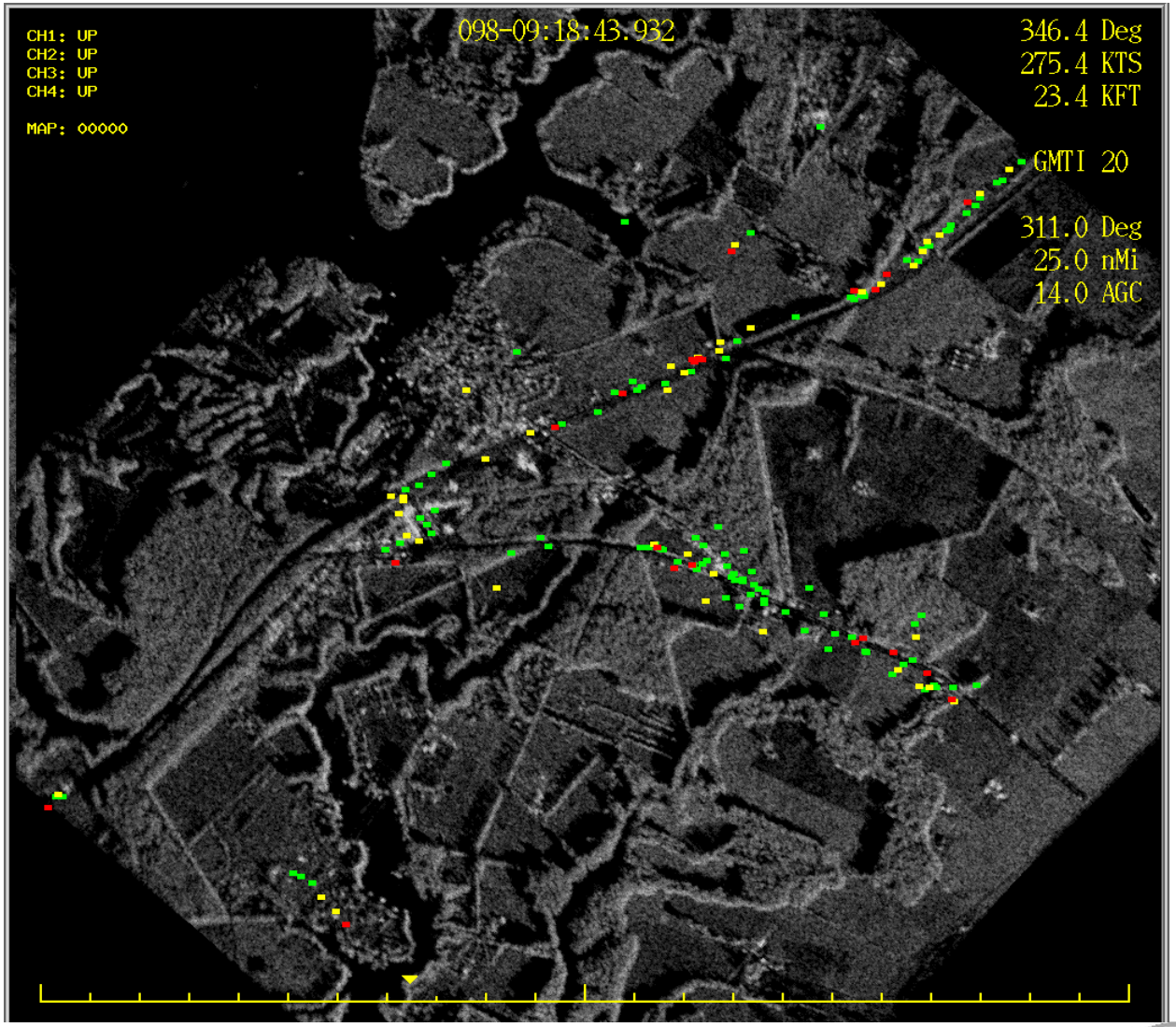
# Sensors

- **Primary Sensors**
  - Radar
  - EO/IR
  - SIGINT
- **Future Growth**
  - Hyperspectral
  - ASW (Comms Relay)

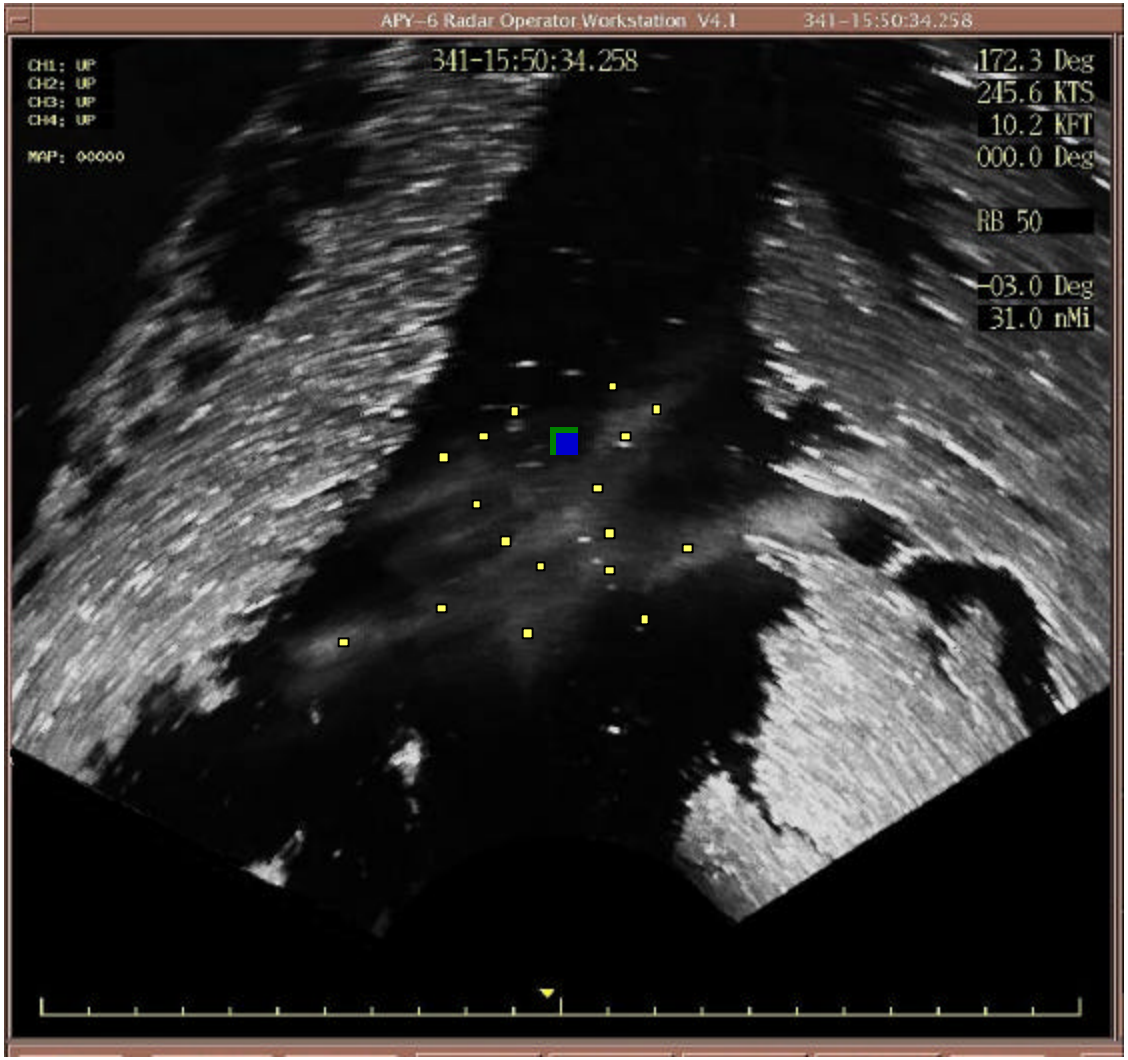
# Sensor Coverage



# Ground Moving Target Indicator (GMTI)



# Radar Surface Search / Maritime Moving Target Indicator (MMTI)

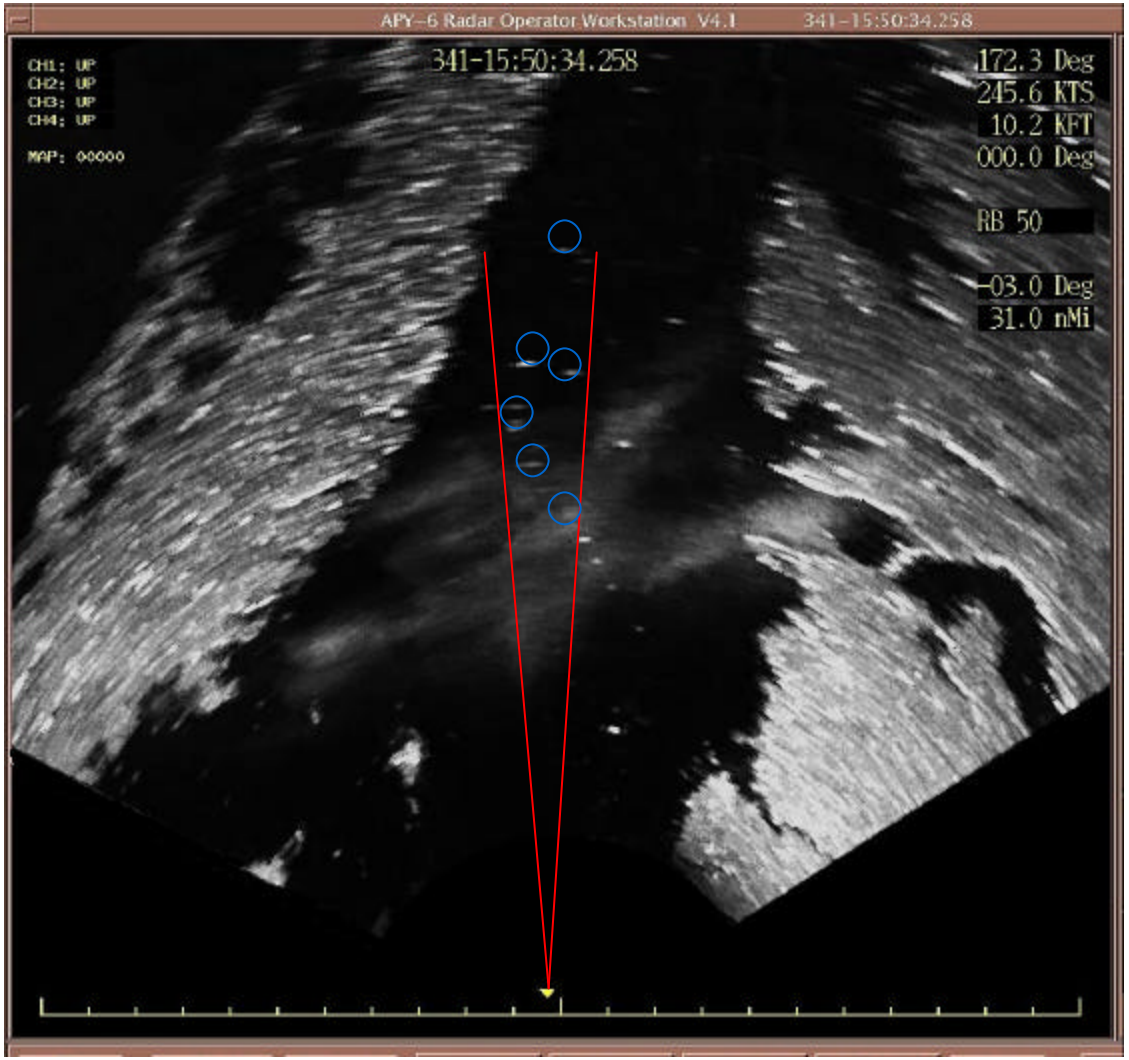


# SIGINT Direction Finding / Specific Emitter Identification

- **SIGINT Provides indications of target presence**
- **Specific Emitter Identification correlates SIGINT with Target of Interest**

# Maritime Search
# Radar Search / Track

- **SIGINT Angle of Arrival / Estimated Range Cues Radar**
- **Radar sweeps and picks up multiple targets within cued sector**

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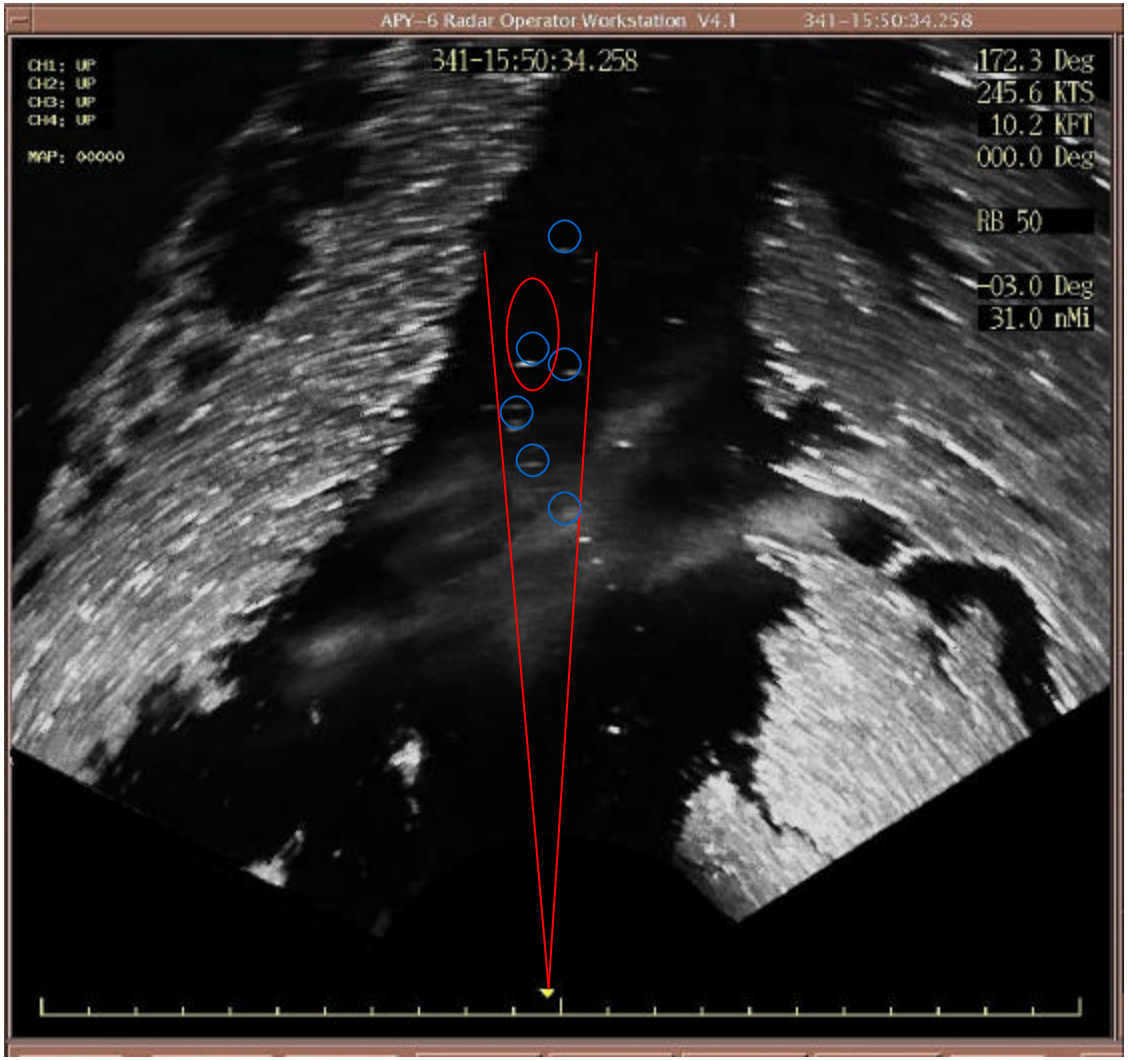
# SIGINT Geo-location

- **SIGINT Time/Frequency Difference Of Arrival Geo-Locates Targets**
- **Emitting target is correlated with Radar**

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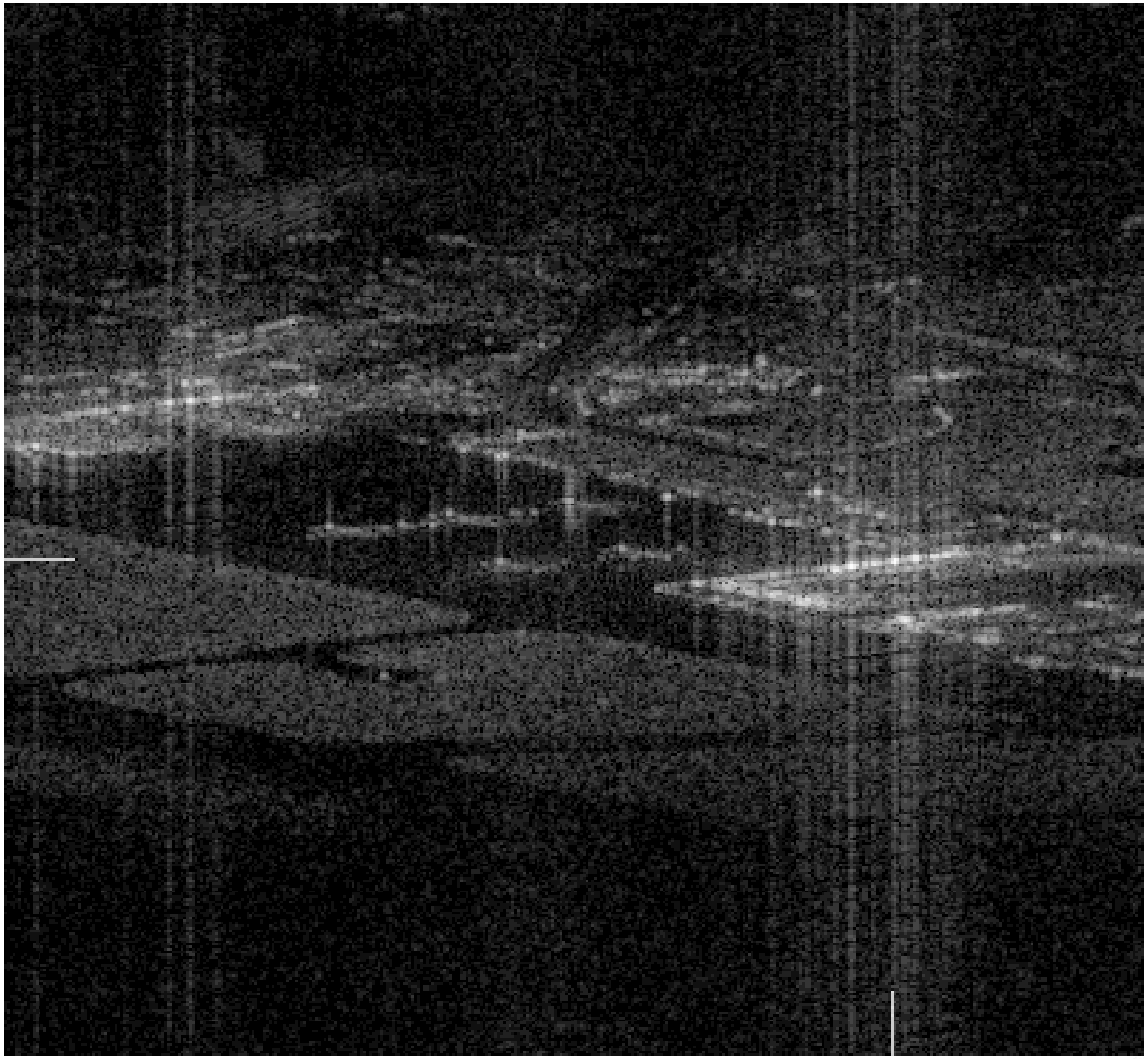
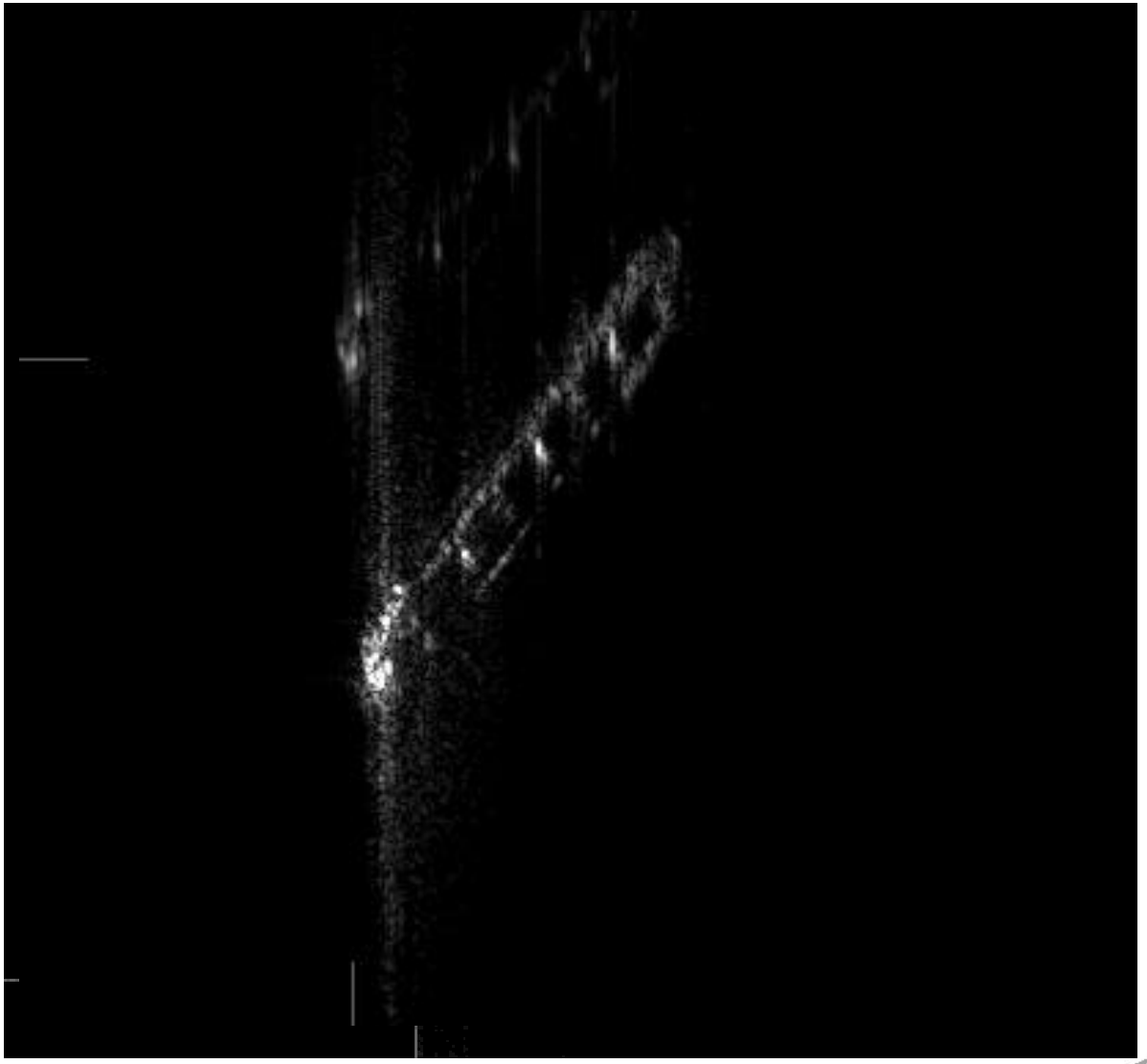
# Synthetic Aperture Radar (SAR)

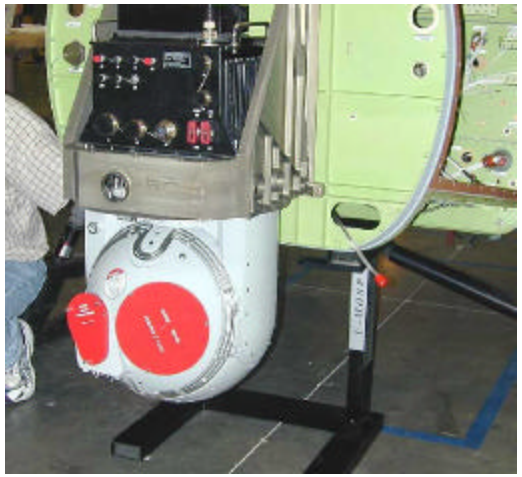


# Inverse Synthetic Aperture Radar (ISAR)



# Firescout Demonstration System Update

# Fire Scout Demonstration System

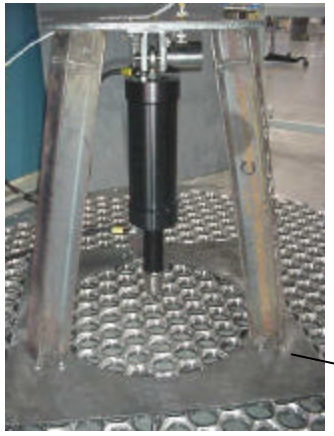


EO/IR/LDRF Payload

UCARS

TCDL

Tactical Control System



Light Harpoon/ Grid

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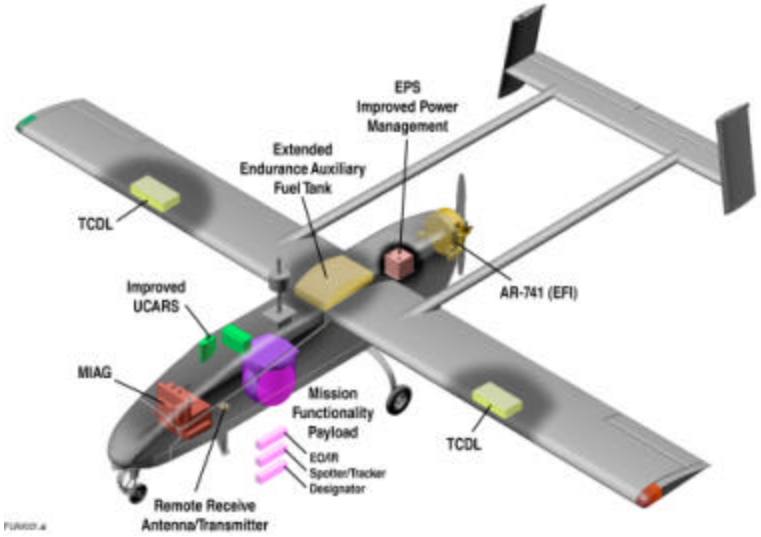
# Pioneer Improvement Program (PIP) Update

# Pioneer Proposed PIP System

Ground Control Station




Pioneer

POP

New Pneumatic Launcher



# Questions?

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